

6 an illumination intensity applied to the photodetector during the integration
 7 period and being limited by a charge capacity voltage applied to the imager,
 8 and to provide a pixel intensity value being proportional to the amount of
 9 accumulated charge;

10 an image brightness detector, coupled to the imager to provide
 11 a measure of the illumination intensity for a brightest object in the image
 12 captured by the imager; and

13 a charge capacity voltage generator, coupled to the image
 14 brightness detector and responsive to the measure of intensity for the
 15 brightest object in a previous image to adjust the charge capacity voltage
 16 applied to the imager to capture a current image.

1 ^{2/5} 14. (Newly Added) An imaging system according to claim
 2 14, wherein:

3 the image brightness detector includes a histogrammer which
 4 generates a histogram of pixel intensity values in the image, and

5 the charge capacity voltage generator analyzes the histogram
 6 provided by the histogrammer to identify a highest intensity value
 7 corresponding to at least N of the pixel intensity values as being the measure
 8 of intensity for the brightest object in the image, where N is an integer.

1 ^{3/6} 15. (Newly Added) An imaging system according to claim
 2 15, where N equals 100.

1 ^{4/6} 16. (Newly Added) An imaging system according to claim
 2 16, further comprising an equalizer, coupled to the histogrammer and
 3 responsive to the histogram provided thereby to redistribute the pixel
 4 intensity values provided by the imager into a range of output pixel intensity
 5 values, whereby fine detail in both bright and dark regions of the sequence of
 6 images is enhanced.

1 18. (Newly Added) An imaging system according to claim
2 14, further comprising a contrast corrector, responsive to the charge capacity
3 voltage provided by the charge capacity voltage generator to adjust the pixel
4 intensity values provided by the imager to conform to a dynamic range that
5 maintains a contrast level consistent with previous images in the image
6 sequence.

1 19. (Newly Added) An imaging system according to claim
2 14, wherein the charge capacity voltage generator generates a first charge
3 capacity voltage for a first portion of the integration period and a second
4 charge capacity voltage, greater than the first charge capacity voltage during
5 a second portion of the integration period, after the first portion, and the first
6 portion has a duration determined by the measure of the intensity for the
7 brightest object in the previous image.

1 20. (Newly Added) An imaging system, comprising:
2 an imager having an array of photodetectors for capturing
3 respective picture elements (pixels) of a time sequence of images, each
4 photodetector being configured to accumulate an amount of charge during an
5 integration period, the amount of charge accumulated being proportional to
6 an illumination intensity applied to the photodetector during the integration
7 period and being limited by a charge capacity voltage used by the imager,
8 and to provide a pixel intensity value being proportional to the amount of
9 accumulated charge;

10 an image brightness detector, coupled to the imager to provide
11 a measure of the illumination intensity for a brightest object in the image
12 captured by the imager; and

13 a function generator, coupled to the image brightness detector
14 and responsive to the measure of intensity for the brightest object in a
15 previous image of the sequence of images to provide a control function that

16 adjusts the charge capacity voltage generated by the imager to capture a
17 current image of the sequence of images..

1 ⁷ 21.⁸ (Newly Added) An imaging system according to claim
2 ¹ 20, wherein:

3 the image brightness detector includes a histogrammer which
4 generates a histogram of pixel intensity values in the image, and

5 the function generator analyzes the histogram provided by the
6 histogrammer to identify a highest intensity value corresponding to at least N
7 of the pixel intensity values as being the measure of intensity for the brightest
8 object in the image, where N is an integer.

1 ⁸ 22.⁹ (Newly Added) An imaging system according to claim
2 ¹ 21, further comprising an equalizer, coupled to the histogrammer and
3 responsive to the histogram provided thereby to redistribute the pixel
4 intensity values provided by the imager into a range of output pixel intensity
5 values, whereby fine detail in both bright and dark regions of the sequence of
6 images is enhanced.

1 ⁹ 23.¹⁰ (Newly Added) An imaging system according to claim
2 ¹ 20, further comprising a contrast corrector, responsive to the control function
3 provided by the control function generator to adjust the pixel intensity values
4 provided by the imager to conform to a dynamic range that maintains a
5 contrast level consistent with previous images in the image sequence.

1 ¹⁰ 24.¹¹ (Newly Added) An imaging system according to claim
2 ¹ 20, wherein the function generator causes the imager to generate a first
3 charge capacity voltage for a first portion of the integration period and a
4 second charge capacity voltage, greater than the first charge capacity voltage,
5 during a second portion of the integration period, after the first portion, and
6 the first portion has a duration determined by the measure of the intensity for
7 the brightest object in the previous image.

A1
Cont

- 12
25. (Newly Added) An imaging system, comprising:
- an imager having an array of photodetectors for capturing respective picture elements (pixels) of a time sequence of images, each photodetector being configured to accumulate an amount of charge during an integration period, the amount of charge accumulated being proportional to an illumination intensity applied to the photodetector during the integration period and being limited by a charge capacity voltage generated by the imager, and to provide a pixel intensity value being proportional to the amount of accumulated charge;
- a histogrammer, coupled to the imager, which generates a histogram of the pixel intensity values provided by the imager;
- a function generator, coupled to the histogrammer, which analyzes the histogram provided by the histogrammer for a previous image in the sequence of images, to identify a highest intensity value corresponding to at least N of the pixel intensity values as being a measure of intensity for a brightest object in the previous image, where N is an integer, the function generator generating a control function that adjusts the charge capacity voltage generated by the imager to capture a current image in the sequence of images responsive to the measure of intensity of the brightest object in the previous image;
- a contrast corrector, responsive to the control function provided by the control function generator to adjust the pixel intensity values provided by the imager to conform to a dynamic range that maintains a contrast level consistent with previous images in the image sequence; and
- an equalizer, coupled to the histogrammer and responsive to the histogram provided thereby to redistribute the pixel intensity values provided by the contrast corrector into a range of output pixel intensity values, whereby fine detail in both bright and dark regions of the sequence of images is enhanced.

A1
Cont

1 ¹² ~~26~~¹³ (Newly Added) An imaging system according to claim
2 ~~26~~, further comprising:

3 a first multiplexer, coupled to selectively provide the pixel
4 intensity values from the imager and the adjusted pixel intensity values from
5 the contrast corrector to the equalizer, whereby the first multiplexer
6 selectively bypasses the contrast corrector; and

7 a second multiplexer, coupled to selectively provide the pixel
8 intensity values from the imager, the pixel intensity values provided by the
9 first multiplexer and the redistributed pixel intensity values from the
10 equalizer as output pixel intensity values, whereby the second multiplexer
11 selectively bypasses the equalizer.

1 ¹⁴ ~~27~~ (Newly Added) A method for controlling an imaging
2 system having an array of photodetectors each of which captures a respective
3 picture element (pixel) of a time sequence of images, each photodetector
4 being configured to accumulate an amount of charge during an integration
5 period, the amount of charge accumulated being proportional to an
6 illumination intensity applied to the photodetector during the integration
7 period and being limited by a charge capacity voltage, and to provide a pixel
8 intensity value being proportional to the amount of accumulated charge, the
9 method including the steps of:

10 measuring an illumination intensity for a brightest object in the
11 image captured by the imager; and

12 adjusting the charge capacity voltage used by the imager to
13 capture a current image of the sequence of images responsive to the
14 measured illumination intensity for the brightest object in a previous image of
15 the sequence of images.

1 ¹⁵ ~~28~~ (Newly Added) A method according to claim ¹⁴ ~~27~~,
2 wherein the step of measuring the illumination intensity for the brightest
3 object in the image captured by the imager includes the steps of:

4 generating a histogram of pixel intensity values in the image,
5 and

6 analyzing the histogram to identify a highest intensity value
7 corresponding to at least N of the pixel intensity values as being the measure
8 of intensity for the brightest object in the image, where N is an integer.

1 ^{26.10} (Newly Added) A method according to claim ^{28.15}, further
2 comprising the step of redistributing the pixel intensity values provided by
3 the imager into a range of output pixel intensity values, responsive to the
4 histogram whereby fine detail in both bright and dark regions of the sequence
5 of images is enhanced.

1 ^{30.17} (Newly Added) A method according to claim ^{26.13}, further
2 comprising the step of adjusting the pixel intensity values provided by the
3 imager, responsive to the adjusted charge capacity voltage, to conform the
4 adjusted pixel intensity values to a dynamic range that maintains a contrast
5 level consistent with previous images in the image sequence.

1 ^{31.18} (Newly Added) A method according to claim ^{26.13}
2 wherein the step of adjusting the charge capacity voltage applied to the
3 imager includes the steps of:

4 generating a first charge capacity voltage for a first portion of
5 the integration period; and

6 generating a second charge capacity voltage, greater than the
7 first charge capacity voltage during a second portion of the integration
8 period, after the first portion;

9 wherein the first portion has a duration determined by the
10 measure of the intensity for the brightest object in the previous image.

1 ^{32.19} (Newly Added) A computer readable medium including
2 computer program instructions that control a computer to implement a
3 method that controls an imaging system having an array of photodetectors

a'
cont

A' cancel

4 each of which captures a respective picture element (pixel) of a time
5 sequence of images, each photodetector being configured to accumulate an
6 amount of charge during an integration period, the amount of charge
7 accumulated being proportional to an illumination intensity applied to the
8 photodetector during the integration period and being limited by a charge
9 capacity voltage, and to provide a pixel intensity value being proportional to
10 the amount of accumulated charge, the method including the steps of:

11 processing the pixel intensity values provided by the imager to
12 measure an illumination intensity for a brightest object in the image captured
13 by the imager; and

14 adjusting the charge capacity voltage used by the imager to
15 capture a current image of the sequence of images responsive to the
16 measured illumination intensity for the brightest object in a previous image of
17 the sequence of images.

1 ¹⁹ ~~33~~ ²⁰ (Newly Added) A computer readable medium according
2 to claim ~~32~~, wherein the computer program instructions that cause the
3 computer to adjust the charge capacity voltage used by the imager cause the
4 computer to provide a first charge capacity voltage for a first portion of the
5 integration period and to generate a second charge capacity voltage, greater
6 than the first charge capacity voltage during a second portion of the
7 integration period, after the first portion, wherein the first portion has a
8 duration determined by the measure of the intensity for the brightest object in
9 the previous image.
